

239, which he quoted as the type of the new genus *Ganoderma*, is represented in the Farlow Herbarium by a duplicate collection bearing the same number, and that this specimen has spores which are thick-walled and coarsely echinulate on the endospore surface. Moreover, going back to Jacquin's original description of *Agaricus pseudoboletus* (in *Flor. austr.* 1: 26-27. pl. 41. 1773; and 2: 44. pl. 169. 1774), and Leysser's account of *Boletus lucidus* (in *Flora Halensis*, 300. 1783; and figured in Curtis, *Flora Londinensis* 4. pl. 224, original edition), we find that the sporophores before these authors were stalked. The resemblance was to that of the sporophores so common in America on Hemlock, and not to Murrill's *G. sessile*. I may also add that in order to get an idea as to whether or not this is a form frequent in Austria, I have examined the specimens of *Ganoderma* found in the von Höhnel collections, now stored in the Farlow Herbarium. All of the plants collected by von Höhnel around Vienna as represented in this herbarium are rough spored, and the stalked form would seem to be the prevailing type. On the other hand it is clear that in Europe there also exists a form similar to or identical with *G. sessile* Murrill, and that it differs essentially from what we consider to be *G. lucidum*. The writer, therefore, unhesitatingly concludes that *G. lucidum* and *G. sessile* are distinct species, each of which is found both in Europe and America, and that they answer to the descriptions given below.

#### DESCRIPTION OF SPECIES

By way of summary, I have ventured to re-define the species studied in this paper as follows:

##### ***Ganoderma lucidum* (Leys.) Karst.**

Sporophore stipitate, stipe lateral, ascending, or short-tuberculate, rarely sessile, annual, rarely perennial; pileus dimidiate or reniform, convex above, plane or concave below; margin plane to broadly lobed, sometimes wavy when dry, surface smooth becoming wrinkled and furrowed when dry, heavily laccate, lustrous, cherry red to deep mahogany or almost black; stipe as in pileus; context felty to corky, or rarely radiate fibrous, light in color except close to tubes; hyphae of context hyaline, frequently branched, rather crooked; tubes cinnamon brown to umber, 3-5 per mm.; crust of vertical solid palisade hyphae, dense and compact, about 40  $\mu$  long; varnish 10 to 12  $\mu$  thick; spores ovoid, slightly asymmetrical on vertical axis, light brown, smooth, but appearing rough, walls thick; endospore coarsely echinulate with relatively few spines; spores 6.3 by 9.8 to 7.7 by 11.9  $\mu$ .

On hardwoods and conifers. In America most commonly on Hemlock. *G. Tsugae* is a synonym. See Figs. 1, 2, 3, 8, 9, 10, and 11.

**Ganoderma sessile** Murrill.

Sporophore sessile, rarely stipitate, annual (rarely perennial?); pileus dimidiate to semi-circular, plane to slightly convex above, usually plane to convex below, usually thick behind; margin acute; surface smooth or irregular, frequently zonate, thinly laccate, lustrous to dull when dry, light brick red to brownish red; margin often lighter tending to yellowish; context radiate fibrous, of two distinct layers, the upper light brown, the lower cinnamon to chocolate brown; hyphae hyaline to brownish, uniform, usually branching infrequently; tubes cinnamon brown to umber; mouths whitish to umber, glaucous where not bruised, 3–5 per mm.; crust of vertical palisade hyphae, compact, but not as dense as in *G. lucidum*, about 30  $\mu$  long; varnish 6 to 8  $\mu$  thick; spores ovoid, slightly asymmetrical on vertical axis, light brown, smooth, walls thin, endospore finely echinulate with numerous delicate spines seen with difficulty; spores 6.3 by 10.5 to 7.0 by 11.6  $\mu$ .

In North America and Europe on deciduous leaved trees (rarely on conifers?). *Ganoderma subperforatum* Atkinson is a synonym. See Figs. 4, 5, 12, 13, 14, and 15.

**Ganoderma Curtisii** (Berk.) Murrill.

Sporophore stipitate, stipe lateral, eccentric or central, annual (or perennial?); pileus reniform to circular, convex or depressed; margin usually thick and abrupt when mature; surface smooth, thinly laccate, often zonate, yellowish brown or orange, with olive tinge when scratched; stipe with persistent varnish, yellowish brown to brick red; context of two layers, the upper light, the lower dark chocolate brown, felty to radiate fibrous; tubes cinnamon brown to umber, mouths whitish; crust of vertical bulbous hyphae, some solid, others empty, of irregular size and height, about 20–25  $\mu$  long; crust frequently peeling off, leaving surface dull cream or yellowish; varnish 6 to 8  $\mu$  thick; spores variable in size and shape, mostly long ovoid, sometimes distinctly curved; light brown, smooth, appearing rough, walls thick, the endospore being coarsely echinulate with few spines; spores 4.8 by 9.5 to 6.3 by 11.2  $\mu$ .

In southeastern North America. Reported only on hardwoods. See Figs. 6, 18, 19, and 20.

**Ganoderma oregonense** Murrill.

Sporophore stipitate with short thick lateral stipe or almost sessile; annual; pileus convex above, usually concave below, relatively thick; margin regular or wavy, rather acute, often with a

furrow close to the edge and paralleling it; surface smooth, heavily encrusted and laccate, dark bay to black; context thick, soft, felty, light buff, deepening in color near the tubes, often with tissue of white mycelium irregularly disposed in lower part near stipe; tubes long, 3 to 5 per mm.; crust of vertical solid palisade hyphae, dense and compact, 50 to 60  $\mu$  long; varnish heavy, 15 to 20  $\mu$  deep; spores ovoid, slightly asymmetrical, light brown, smooth, with echinulate thick walled endospore; spines coarse and relatively few; spores 7.4 by 11.9 to 8.4 by 14.0  $\mu$ .

On conifers in western North America. See Figs. 7, 16 and 17.

This species was first described by Murrill in North American Flora, at which time it was known only from the type locality in Oregon. It is now known to occur generally on the Pacific slope, and has been collected on a number of conifers besides *Picea sitchensis*, on a log of which it was first found. It bears a close resemblance to Atkinson's *G. pseudoboletum* var. *montanum* but has definitely larger spores.

#### SPECIMENS STUDIED

##### (a) *Ganoderma oregonense*.

HERBARIUM J. H. FAULL: specimen 3691 on *Tsuga heterophylla*, Sonora Island, British Columbia; spec. 6706 on Douglas Fir, Royston, B. C.; spec. 9355 on conifer, Vancouver, B. C.

HERBARIUM NEW YORK BOT. GARD.: spec. 6 (*type*) on old log of *Picea sitchensis*, near Seaside, Oregon; spec. coll. by H. D. House, Martha's Lake, near Everett, Wash.

##### (b) *Ganoderma Curtisii*.

HERBARIUM J. H. FAULL: spec. 3568 on Oak, Thomasville, Ga.; spec. 3682 on dead hardwood, Pinehurst, N. C.; spec. 175.

HERBARIUM NEW YORK BOT. GARD.: spec. 4389 on dead wood; spec. on dead Oak, Biloxi, Aug. 31, 1904. E. G. E.; spec. on *Quercus rubra* stump, Alliston, Mo.; spec. coll. by B. B. Higgins, Experiment, Ga.; spec. 545 ex. Herb. A. Commons; spec. coll. by W. A. Murrill, Biltmore, N. C., Oct. 1907; spec. coll. by Edwin Fowler, on root of Maple, Trenton, N. J., labelled *G. sessile*.

##### (c) *Ganoderma lucidum*.

HERBARIUM J. H. FAULL: spec. 181 *G. lucidum*, on *Betula alba*, Toronto, Ont.; spec. 183 *G. lucidum* on Oak stump, Toronto; spec. 182 *G. lucidum*, on *Betula lutea*, Wilcox Lake, Ont.; spec. 179 *G. lucidum* forma *montanum*, Vosges,